

PATENT
Customer Number 22,852
Attorney Docket No. 5788.0124.00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
)
Paola CARACINO et al.)
)
Serial No.: 09/498,062) Group Art Unit: 2841
)
Filed: February 4, 2000) Examiner: Vu, Q.
)
For: HIGH TEMPERATURE)
SUPERCONDUCTING CABLE AND)
PROCESS FOR MANUFACTURING)
THE SAME)

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

AMENDMENT

In reply to the Office Action mailed August 23, 2001, the period for reply having
extended by three months by a request for extension and fee payment filed with this Amendment,
please amend the application as follows:

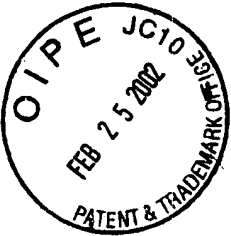
IN THE TITLE:

Please amend the title, as follows:

HIGH TEMPERATURE SUPERCONDUCTING CABLE

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IN THE CLAIMS:

Please cancel, without prejudice or disclaimer, claims 44-50, and amend claims 27, 28, 31-36, and 38-43, as follows:

27. (once amended) A high temperature superconducting cable, comprising:
a tubular support; and

a plurality of superconducting tapes spirally wound onto the tubular support to form at least an electroinsulated, thermally-insulated, and refrigeratable superconducting layer, wherein the superconducting tapes include a superconducting material enclosed in a metal covering;

wherein the superconducting tapes comprise at least one metal strip coupled to the metal covering.

28. (once amended) The cable of claim 27, wherein the superconducting tapes have a maximum bearable tensile deformation greater than 3% during manufacture and installation.

31. (once amended) The cable of claim 27, wherein the at least one metal strip is coupled to the metal covering by welding.

32. (once amended) The cable of claim 27, wherein the at least one metal strip is coupled to the metal covering by brazing.

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33. (once amended) The cable of claim 27, wherein the at least one metal strip is coupled to the metal covering by gluing.

34. (once amended) The cable of claim 27, wherein the at least one metal strip is made of non-magnetic stainless steel having a low electric conductivity.

35. (once amended) The cable of claim 27, wherein the at least one metal strip is made of bronze.

36. (once amended) The cable of claim 27, wherein the at least one metal strip is made of aluminum.

38. (once amended) The cable of claim 27, wherein the tubular support is made of non-magnetic stainless steel.

39. (once amended) The cable of claim 27, wherein the tubular support is made of copper.

40. (once amended) The cable of claim 27, wherein the tubular support has a continuous structure, either smooth or corrugated.

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41. (once amended) The cable of claim 27, wherein the tubular support has a spirally-wound metal strip structure.

42. (once amended) The cable of claim 27, wherein the tubular support has a tile structure.

43. (once amended) The cable of claim 27, wherein a winding angle of the superconducting tapes onto the tubular support is smaller than 40°.

REMARKS

Applicants submit this Amendment, accompanied by an Appendix to Amendment Dated February 25, 2002, a Request for Approval of Drawing Change, and a Petition for Extension of Time, in response to the Office Action mailed August 23, 2001.

In the Office Action, the Examiner objected to the drawings; rejected claim 29 under 35 U.S.C. § 112, ¶ 2; rejected claims 27, 29, 37-39, 41, and 42 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,262,375 to Engelhardt et al. ("Engelhardt"); and rejected claims 28, 30-36, 40, and 43 under 35 U.S.C. § 103(a) as being unpatentable over Engelhardt.

In this Amendment, Applicants submit a Request for Approval of Drawing Change to add new Fig. 3. Additionally, Applicants amend the title. Further, Applicants cancel, without prejudice or disclaimer, claims 44-50. Finally, Applicants amend claims 27 and 31-36 to improve clarity, amend claim 28 to correct the claimed units from "%" to "%o", and amend claims 38-43 to change claim dependency from claim 37 to claim 27.

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No claim amendments are made in response to the rejections under 35 U.S.C. § 112, ¶ 2, 35 U.S.C. § 102(e), or 35 U.S.C. § 103(a).

Before entry of this Amendment, claims 27-50 were pending in this application. After entry of this Amendment, claims 27-43 are pending in this application.

The originally-filed specification, claims, abstract, and drawings fully support the addition of new Fig. 3, the amendment to the title, and the amendments to claims 27, 28, 31-36, and 38-43. No new matter was introduced.

Drawing Change

Applicants respectfully submit that addition of new Fig. 3 resolves the objection to the drawings and the rejection of claim 29 under 35 U.S.C. § 112, ¶ 2. Support for the addition of new Fig. 3 is provided at least by Fig. 2 of the originally-filed drawings and the specification at p. 6/11. 27-29, p. 10/11. 33-35, and originally-filed claims 3 and 20.

Other Issues

In response to the Office Action at p. 4/§ 9, Applicants respectfully submit that the claim 28 language “wherein the superconducting tapes have a maximum bearable tensile deformation . . . during manufacture and installation” is directed to a physical characteristic of the superconducting tapes and, thus, is not a product-by-process limitation.

Also in response to the Office Action at p. 4/§ 9, Applicants also submit that none of the phrases “by welding,” “by brazing,” and “by gluing” appear in claim 30.

Additionally, in response to the Office Action at p. 5/§ 10, Applicants disagree with the Examiner’s characterization of U.S. Patent No. 4,417,093 to Occhini et al. (“Occhini”) as disclosing a high temperature superconducting cable.

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Finally, Applicants traverse the rejections of claims 27, 29, 37-39, 41, and 42 under 35 U.S.C. § 102(e) and the rejection of claims 28, 30-36, 40, and 43 under 35 U.S.C. § 103(a) for the reasons stated below.

Engelhardt

As discussed by the Examiner, Engelhardt discloses a plurality of superconducting tapes (120, 125). (Office Action, p. 3/§ 7). Engelhardt also discloses a conductive shield (190) and skid wires (195). (Engelhardt, c. 6/ll. 21-34, c. 6/l. 50, and Figs. 1-3). Additionally, Engelhardt discloses a thin layer of stainless steel tape (160). (Id., c. 5/ll. 60-67, c. 7/ll. 21-22, and Figs. 1-4). Applicants note that Engelhardt states: “[I]f tube 150 is not corrugated, then [stainless steel] tape (160) may be omitted.” (Id., c. 5/ll. 65-66) (emphasis added).

The Examiner appears to characterize conductive shield (190) and skid wires (195) as “metal strips” coupled to the thin layer of stainless steel tape (160). (Office Action, p. 3/§ 7). The Examiner also appears to characterize the superconducting tapes (120, 125) as comprising a metal strip (190, 195) coupled to the thin layer of stainless steel tape (160). (Id.).

Initially, Applicants respectfully submit that an inspection of Figs. 1-3 of Engelhardt (and/or its specification) demonstrates that superconducting tapes (120, 125) cannot “comprise” either conductive shield (190) or skid wires (195) under any definition of the term “comprise.” This is true, at least in part, because superconducting tapes (120, 125) are physically separated from conductive shield (190) and skid wires (195) by at least space (130), thermally-superinsulating material (140), corrugated tube/cryostat outer wall/outer cryostat tube (150), carbon-black-impregnated tape (170), and dielectric (180).

Further, Applicants submit that because there is no direct physical contact between either conductive shield (190) or skid wires (195) and the thin layer of stainless steel tape (160), neither conductive shield (190) or skid wires (195) is coupled to the thin layer of stainless steel tape (160). Applicants' position is further supported by the optional nature of the thin layer of stainless steel tape (160).

Therefore, Engelhardt does not disclose at least: (1) a plurality of superconducting tapes including a superconducting material enclosed in a metal covering and spirally wound onto the tubular support to form at least an electroinsulated, thermally-insulated, and refrigerated superconducting layer, wherein the superconducting tapes comprise at least a metal strip coupled to the metal covering [claim 27 (new) (emphasis added)]; or (2) a plurality of superconducting tapes spirally wound onto the tubular support to form at least an electroinsulated, thermally-insulated, and refrigeratable superconducting layer, wherein the superconducting tapes include a superconducting material enclosed in a metal covering, wherein the superconducting tapes comprise at least one metal strip coupled to the metal covering [claim 27 (once amended) (emphasis added)].

Rejections Under 35 U.S.C. § 102(e)—Independent Claim

Applicants submit that both independent claim 27 (new) and independent claim 27 (once amended) are patentable over the cited references, including Engelhardt and the other art of record.

For anticipation under 35 U.S.C. § 102(e), the reference must teach every aspect of the claimed invention either explicitly or implicitly. See M.P.E.P. 706.02. However, as discussed above, Engelhardt does not disclose at least: (1) a plurality of superconducting tapes including a

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superconducting material enclosed in a metal covering and spirally wound onto the tubular support to form at least an electroinsulated, thermally-insulated, and refrigerated superconducting layer, wherein the superconducting tapes comprise at least a metal strip coupled to the metal covering [claim 27 (new)]; or (2) a plurality of superconducting tapes spirally wound onto the tubular support to form at least an electroinsulated, thermally-insulated, and refrigeratable superconducting layer, wherein the superconducting tapes include a superconducting material enclosed in a metal covering, wherein the superconducting tapes comprise at least one metal strip coupled to the metal covering [claim 27 (once amended)].

Therefore, independent claim 27 is patentable over the cited references including Engelhardt and the other art of record.

Rejections Under 35 U.S.C. § 102(e)—Dependent Claims

Applicants submit that dependent claims 29, 37-39, 41, and 42 are patentable over the cited references including Engelhardt and the other art of record. This is true whether such art is considered alone or in any proper combination, in particular, at least due to the dependency of claims 29, 37-39, 41, and 42 from independent claim 27.

Rejections Under 35 U.S.C. § 103(a)—Dependent Claims

To establish a prima facie case of obviousness under 35 U.S.C. § 103(a) using a single reference: (1) there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference; (2) there must be a reasonable expectation of success; and (3) the prior art reference must teach or suggest all the claim limitations. See M.P.E.P. 2143.

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However, as discussed above, Engelhardt does not even teach or suggest all the claim limitations of independent claim 27. Specifically, Engelhardt does not disclose at least: (1) a plurality of superconducting tapes including a superconducting material enclosed in a metal covering and spirally wound onto the tubular support to form at least an electroinsulated, thermally-insulated, and refrigerated superconducting layer, wherein the superconducting tapes comprise at least a metal strip coupled to the metal covering [claim 27 (new)]; or (2) a plurality of superconducting tapes spirally wound onto the tubular support to form at least an electroinsulated, thermally-insulated, and refrigeratable superconducting layer, wherein the superconducting tapes include a superconducting material enclosed in a metal covering, wherein the superconducting tapes comprise at least one metal strip coupled to the metal covering [claim 27 (once amended)]. For at least this reason, no prima facie case of obviousness under 35 U.S.C. § 103(a) based on the Engelhardt reference has been established with regard to independent claim 27 or any claim dependent from independent claim 27.

Therefore, Applicants submit that dependent claims 28, 30-36, 40, and 43 are patentable over the cited references including Engelhardt and the other art of record. This is true whether such art is considered alone or in any proper combination, in particular, at least due to the dependency of claims 28, 30-36, 40, and 43 from independent claim 27.

Summary

In view of the foregoing amendments and remarks, Applicants respectfully request the reconsideration and reexamination of this Application and the timely allowance of the pending claims.

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Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: February 25, 2002

By: 

Lawrence F. Galvin
Reg. No. 44,694

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APPENDIX TO AMENDMENT DATED FEBRUARY 25, 2002

Amendments to the Title

Please amend the title, as follows:

HIGH TEMPERATURE SUPERCONDUCTING CABLE [AND PROCESS FOR
MANUFACTURING THE SAME]

Amendments to the Claims

Please amend claims 27, 28, 31-36, and 38-43, as follows:

27. (once amended) A high temperature superconducting cable, comprising:

a tubular support; and

a plurality of superconducting tapes [including a superconducting material enclosed in a metal covering and] spirally wound onto the tubular support to form at least an electroinsulated, thermally-insulated, and [refrigerated] refrigeratable superconducting layer, wherein the superconducting tapes include a superconducting material enclosed in a metal covering;

wherein the superconducting tapes comprise at least [a] one metal strip coupled to the metal covering.

28. (once amended) The cable of claim 27, wherein the superconducting tapes have a maximum bearable tensile deformation greater than [3%] 3‰ during manufacture and installation.

31. (once amended) The cable of claim 27, wherein the at least one metal strip is coupled to the metal covering by welding.

32. (once amended) The cable of claim 27, wherein the at least one metal strip is coupled to the metal covering by brazing.

33. (once amended) The cable of claim 27, wherein the at least one metal strip is coupled to the metal covering by gluing.

34. (once amended) The cable of claim 27, wherein the at least one metal strip is made of non-magnetic stainless steel having a low electric conductivity.

35. (once amended) The cable of claim 27, wherein the at least one metal strip is made of bronze.

36. (once amended) The cable of claim 27, wherein the at least one metal strip is made of aluminum.

38. (once amended) The cable of claim [37] 27, wherein the tubular support is made of non-magnetic stainless steel.

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39. (once amended) The cable of claim [37] 27, wherein the tubular support is made of copper.

40. (once amended) The cable of claim [37] 27, wherein the tubular support has a continuous structure, either smooth or corrugated.

41. (once amended) The cable of claim [37] 27, wherein the tubular support has a spirally-wound metal strip structure.

42. (once amended) The cable of claim [37] 27, wherein the tubular support has a tile structure.

43. (once amended) The cable of claim [37] 27, wherein a winding angle of the superconducting tapes onto the tubular support is smaller than 40°.

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